# Project Overview

This project is a collaboration between the students of Seneca Polytechnic in Toronto, Ontario, and the students of Universidade de Coruna in Spain.

The goal of this project is to create an application that can generate linear regression models. It is for a client that wants an application that can load spreadsheet files and datasets to create these models. The app is intended to be used for creating regression models using real estate data but can be used for other datasets, such as financial ones.

This application was created in Python and uses the Tkinter library to create the user interface. Additional Python libraries used include:

* sqlite3
* pandas
* Joblib
* and sqlalchemy.

The app allows users to create and visualize simple linear regression models using data stored in CSV, Excel, and database (SQLite) files. It also enables them to make predictions based on the models they have created and save and load them.

## Agile Development Process

This application was developed in sprints using the agile development method.

The developers were given tasks to complete within week-to-week periods (sometimes two weeks), during which they would decide which tasks to finish. Many tasks required earlier tasks to be finished before they could begin.

Developers decided among themselves who should complete their given tasks and assigned these tasks using Taiga, a type of project management software in which their tasks were listed. Larger tasks, such as adding a feature to the application, required more than one developer to complete on time.

Tasks that were incomplete by the end of a sprint were pushed to the next sprint, which happened several times throughout the development cycle. This caused some delays, but the team has always been able to bounce back and finish their tasks.

At the end of every sprint, the developers met with the product owner to review their work. The product owner recommended how to go ahead with the project and made suggestions for improving what had already been created. This included changes like altering the overall look of the application and small adjustments, such as changing how text appeared on the generated models.

Developers also met with the documentation team to discuss what tasks they had completed during their sprint. They helped the doc team understand how to install and run the application and what features were completed so that documentation could begin.

## What is Artificial Intelligence?

Artificial intelligence (AI) is a set of technologies that allow machines to perform actions normally done by humans. Examples include:

* Reasoning
* decision making
* and problem-solving.

Using mathematical equations, the application can interpret the inputted data and generate models with little user interaction. This saves users from doing any math on their own to create models; it’s all done inside the app.

## What is Linear Regression?

Linear regression is a data analysis technique that predicts the value of unknown data by using a related and known data value. It models the unknown—the dependent variable—and the known—the independent variable—as a linear equation.

The independent variable does not rely on another variable to find its value, making it “independent.” A “dependent” variable is the opposite, as it relies on another variable to find its value.

### How does it apply to the project?

Users generate independent variables using data from their datasets. The application's artificial intelligence calculates the dependent variable and uses it to create the linear regression model.

## Additional Information

The current development team is:

* **Alberto José Alvarellos González**, the product owner.
* **Amy Briggs**. documentation manager.
* **Natalia Martinez Garcia**, scrum master and development team member.
* **Sneshanka Blanca Andres Ochoa**, development team member.
* **Pablo Nicholas Iglesias Cabado**, development team member.
* **Lusia Vega Navarrette**, development team member.
* **Lucas Paul**, documentation team member.

The application was created in Spanish but was translated into English by the development team so the documentation team could better understand the product. This made documentation easier but also made the app usable by people who don’t speak Spanish.

Documentation created by Lucas Paul was written in markdown.

This application is expected to be finished development before the end of 2024.